The Role of Pressurized HVAC Systems in Contributing to Obesity in Context of Ease of CO2 Exchange Relative to Barometric Pressure

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Introduction

Building upon the barometric hypothesis of 7 April 2022 concerning the tendency toward lower obesity rates in U.S. States at higher elevations and higher obesity rates in states in low-lying areas with higher average barometric pressures, this paper explores the possibility that not only does the removal of particulates such as pollen contribute to decreased CO2 exchange in the lungs (as mentioned in the other of two papers published 7 April 2022,) but a pressure differential generated by many HVAC systems may be to blame to an even greater extent than the removal of natural surfactants.

Abstract

Most HVAC systems have a feature which draws outside air into a domicile, thereby increasing the barometric pressure in the interior of the domicile. The manufacturers' rationales for this are twofold: Drawing in outside air ensures that sufficient oxygen is available for inhabitants and, more significantly, this overpressurization of the domicile is designed to create efficiency by keeping outside air from seeping in, particularly in the winter.

This mode of operation is unreasonable and is likely contributing to the inexplicable increase in the rate of obesity in countries which feature these central heating and cooling systems. Firstly, it is important to point out that overpressurization of a domicile will prevent drafts only in the winter when the outdoor air is more dense than the heated, indoor air. In the summer, this actually wastes energy as it results in the leakage of cool air.

Any potential gain in efficiency achieved by creating positive air pressure within the domicile is negated by the act of drawing cold, outside air into the domicile.

Anyone who has ever operated a reversible window fan knows that expelling air can cool a room and circulate air just as effectively as drawing outside air in. A central heating and cooling system could, with a slight modification, be made to operate according to the principle of negatively pressurizing domiciles. This would result in fresh air being drawn in through seepage rather than directly into the ductwork, but would still achieve the desired effect of bringing oxygenated air into the domicile to prevent dangerously stagnant air.

Importantly, this slightly negative pressure would emulate the natural conditions found at the higher elevations in states such as Colorado, which boasts the lowest rate of obesity of any U.S. State. In the presence of lower barometric pressure, CO2 exchange is made more efficient and serum CO2 would decrease. Reduced serum CO2 would lead to reduced fat retention and

would drive down the rate of obesity, even in comparison to someone who does not spend time inside of climate-controlled buildings.

Conclusion

Inverting the pressurization dynamics of commonly used HVAC systems would require only a small amount of time and effort but could literally add years to the lives of those who make this simple adjustment. Health care costs would be reduced across the board.